

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

SciVerse ScienceDirect

journal homepage: [www.elsevier.com/locate/crvasa](http://www.elsevier.com/locate/crvasa)

## Commentary

# Comments on the Summary of the ESC guidelines on the management of valvular heart disease (version 2012)

Jana Popelová<sup>a,b,\*</sup>, Miroslav Brtko<sup>c</sup>, Petr Němec<sup>d</sup>

<sup>a</sup>Cardiocenter, Department of Cardiac Surgery, Hospital Na Homolce, Prague 5, Czech Republic

<sup>b</sup>Paediatric Heart Center, University Hospital Motol, Prague 5, Czech Republic

<sup>c</sup>Cardiocenter, Department of Cardiac Surgery, Charles University Prague, Faculty of Medicine and University Hospital, Hradec Králové, Czech Republic

<sup>d</sup>Center for Cardiovascular Surgery and Transplantation, Brno, Czech Republic

## ARTICLE INFO

Available online 4 February 2013

## 1. Introduction

The Euro Heart Survey on valvular heart disease discovered a large number of patients with severe symptomatic valve diseases, who were not indicated for intervention [1,2]. The reasons were mainly older age and left ventricular dysfunction. The new ESC guidelines clearly specify the possibility of surgical or interventional treatment of high risk patients in experienced centers. On the other hand, we can see the trend toward early surgery in asymptomatic patients with severe valvular disease. The operation before ventricular dilatation and dysfunction improves early mortality, as well as long-term postoperative survival. It was the development of echocardiography with detailed non-invasive evaluation of the valvular pathology and its consequences, which enabled the quick progress in valve-sparing surgery. The absence of life-long anticoagulation and low surgical mortality in asymptomatic patients with good ventricular function facilitates the early indication for surgery.

## 2. Mitral regurgitation

More detailed criteria for echocardiographic evaluation of the severity of different valve diseases may be found in the Recommendations of the European Association of Echocardiography [3–5].

However, the definition of mild and moderate ischemic (functional, secondary) mitral regurgitation (MR) is difficult to find, even though the guidelines on valvular disease mention it. Functional mitral regurgitation is dynamic and depends predominantly on the shape and function of the left ventricle, loading conditions and systolic pressure. The criteria for severe functional ischemic MR (EROA  $\geq 20$  mm<sup>2</sup>, RV  $\geq 30$  ml) are based on prognostic data and identify patients with increased risk of cardiovascular events. Exercise echocardiography may discover increased severity of the functional MR and should be performed before the planned surgery. Patients with the increase of EROA by  $\geq 13$  mm<sup>2</sup> during exercise also have increased risk. The optimal approach to patients with ischemic MR who do not fulfill the criteria of severe ischemic MR (neither at rest nor during exercise), is not clear and has to be assessed.

There is a different approach to severe asymptomatic primary MR between the new ESC and ACC/AHA guidelines [6,7]. Patients with severe chronic asymptomatic MR with normal left ventricular systolic function (EF  $> 60\%$ ) and left ventricular end-systolic dimension (LVESD)  $< 40$  mm would undergo mitral valve repair in expert center according the ACC/AHA guidelines, if there was more than 90% likelihood of successful repair with no residual MR. In Europe, this patient would have a chance for repair only in the case of flail leaflet with LVESD  $\geq 40$  mm.

\*Corresponding author at: Cardiocenter, Department of Cardiac Surgery, Hospital Na Homolce, Prague 5, Czech Republic.  
Tel.: +420 605513540.  
E-mail address: [jana.popelova@homolka.cz](mailto:jana.popelova@homolka.cz) (J. Popelová).

However, we believe that even in Europe we have expert centers with excellent results of mitral valve repair and low operative mortality. If there is a clear pathology with severe MR, the conservative observation can hardly improve the prognosis.

ACEI are not recommended in organic MR without heart failure, however, they should be used for the treatment of hypertension in patients with MR.

### 3. Aortic regurgitation

The ESC and ACC/AHA guidelines use the indexed values of heart chambers and aorta diameters inconsistently. We think that the indexed values are useful and we recommend its use. The indexation is usually for body surface area (BSA). The dimensions may be indexed also for height, which might be more appropriate for obese patients; however the prognostic data for this type of indexation are missing. In the Czech guidelines we suggested the cut-off values for intervention in severe asymptomatic aortic regurgitation (AR) 35 mm/m<sup>2</sup> BSA for the end-diastolic left ventricular dimension and 25 mm/m<sup>2</sup> for the LVESD, to exclude the risk of persistent left ventricular dilatation and dysfunction after operation [8,9]. This is important especially for women, in whom the increased long-term mortality after aortic valve replacement for AR could be explained by underestimation of the left ventricular dilatation. We also should not forget, that left ventricle with increased wall thickness (as a consequence of hypertension, concomitant aortic stenosis or coarctation) does not dilate even in severe AR.

The ESC guidelines do not mention the indexed values for the dilatation of ascending aorta. This may be misleading for both sides of BSA spectrum. For example, a girl with Turner syndrome might have BSA of 1.3 m<sup>2</sup>—her ascending aorta of 40 mm represents 31 mm/m<sup>2</sup> BSA. On the other hand, a man with BSA 2.2 m<sup>2</sup> and ascending aorta of 55 mm has indexed value of 25 mm/m<sup>2</sup>. Of course, not only the BSA, but also the proportionality of the size of heart and aorta is important. The upper limit for aortic bulbus is 21 mm/m<sup>2</sup> BSA; dilatation has been defined as 50% increase, that means 31.5 mm/m<sup>2</sup> [6,7]. The possible cut-off value for aortic surgery of the ascending aorta is the indexed value of 25 mm/m<sup>2</sup>, especially in bicuspid aortic valves, according to the ACC/AHA guidelines [6,7]. In patients after coarctation repair, the intervention is recommended if ascending aorta exceeds the diameter of 27.5 mm/m<sup>2</sup> [10].

### 4. Aortic stenosis

The ESC guidelines define severe aortic stenosis (AS) by AVA <1 cm<sup>2</sup> or 0.6 cm<sup>2</sup>/m<sup>2</sup>; however many experienced cardiologists would prefer the cut-off value of 0.5 cm<sup>2</sup>/m<sup>2</sup> or 0.8 cm<sup>2</sup> for the “really severe” AS. Especially, if we consider the operation of severe asymptomatic AS with normal LVEF, the AVA should be <0.8 cm<sup>2</sup> and the patient should have at least one of the following characteristics: a positive exercise test, heavy valve calcifications, rapid progression of AS, excessive left ventricular hypertrophy or elevated natriuretic peptides [11]. We think that the exercise test in a patient with severe AS should be evaluated as abnormal if the blood pressure

falls, but not necessarily below the baseline. The onset of symptoms may be predicted by the elevation of the natriuretic peptides [11].

Patients with low-flow, low-gradient severe AS with preserved LVEF have worse prognosis than those with severe AS with high gradient [12]. The differentiation of the “paradoxical” low-flow, low-gradient severe AS with preserved LVEF from moderate AS is crucial, because the operation improves long-term survival in low-flow, low-gradient severe AS with preserved ejection fraction, but not in the moderate AS [12].

The new ESC guidelines define indications for TAVI (transcatheter aortic valve implantation) with a great impact on the heart-team decision. In this way, not only the Euroscore, but also other factors, e.g. porcelain aorta, history of chest radiotherapy and other risk factors may individually be taken into account.

### 5. Anticoagulation therapy

Different approaches can be found between the ESC guidelines (original full-text) and recommendations for the management of patients after heart valve surgery [13] in the solution of increased INR. Butchart does not recommend giving vitamin K if the patient is not bleeding and INR does not exceed 10, because of the risk of valve thrombosis if INR falls down rapidly [13]. In a patient with INR >6 oral anticoagulants should be stopped and the patient should be admitted to the hospital; in case of INR >10, fresh frozen plasma should be considered. In the case of bleeding with high INR, local control of bleeding, prothrombin complex or vitamin K may be necessary, even if they increase the risk of valve thrombosis. In the ESC guidelines the oral vitamin K in low dose (1–2 mg) is considered a possibility in INR 6–10; in INR >10 the recommended dose is 5 mg. Presently, there are no sufficient data to recommend new antithrombotic drugs (direct oral inhibitors of factor IIa or Xa) to patients with mechanical heart valves.

In conclusion, the ESC guidelines are clear, useful and we believe that they will help in improving the care of patients with valvular heart diseases.

### REFERENCES

- [1] B. Iung, A. Cachier, G. Baron, et al., Decision-making in elderly patients with severe aortic stenosis: why are so many denied surgery?, *European Heart Journal* 24 (2005) 2414–2420.
- [2] M. Mirabel, B. Iung, G. Baron, et al., What are the characteristics of patients with severe, symptomatic, mitral regurgitation who are denied surgery?, *European Heart Journal* 11 (2007) 1358–1365.
- [3] P. Lancellotti, Ch. Tribouilloy, A. Hagendorff, et al., European Association of Echocardiography recommendations for the assessment of valvular regurgitation. Part 1: aortic and pulmonary regurgitation (native valve disease), *European Journal of Echocardiography* 11 (2010) 223–244.
- [4] P. Lancellotti, L. Moura, L.A. Pierard, et al., European Association of Echocardiography recommendations for the assessment of valvular regurgitation. Part 2: mitral and tricuspid regurgitation (native valve disease), *European Journal of Echocardiography* 11 (2010) 307–332.

- 
- [5] H. Baumgartner, J. Hung, Bermejo Ch, et al., Echocardiographic assessment of valve stenosis: EAE/ASE recommendations for clinical practice, *European Journal of Echocardiography* 10 (2009) 1–25.
- [6] R.O. Bonow, B.A. Carabello, K. Chatterjee, et al., ACC/AHA 2006 guidelines for the management of patients with valvular heart disease, *Journal of the American College of Cardiology* 48 (3) (2006) e1–148.
- [7] R.O. Bonow, B.A. Carabello, K. Chatterjee, et al., Focused update incorporated into the ACC/AHA 2006 guidelines for the management of patients with valvular heart disease, *Circulation* 118 (2008) e523–e661.
- [8] J. Popelová, M. Benešová, M. Brtko, et al., Doporučené postupy pro diagnostiku a léčbu chlopenních srdečních vad v dospělosti (Recommendations for diagnosis and treatment of valvular heart disease in adults – in Czech), *Cor et Vasa* 49 (11) (2007) 6–45.
- [9] A. Sambola, P. Tornos, I. Ferreira-Gonzales, A. Evangelista, Prognostic value of preoperative indexed end-systolic left ventricular diameter in the outcome after surgery in patients with chronic aortic regurgitation, *American Heart Journal* 155 (6) (2008) 1114–1120.
- [10] H. Baumgartner, P. Bonhoeffer, N.M.S. De Groot, et al., ESC Guidelines for the management of grown-up congenital heart disease (new version 2010), *European Heart Journal* 31 (2010) 2915–2957.
- [11] B.A. Carabello, Aortic valve replacement should be operated on before symptom onset, *Circulation* 126 (2012) 112–117.
- [12] M.A. Clavel, J.G. Dumesnil, R. Capoulade, P. Mathieu, M. Sénéchal, P. Pibarot, Outcome of patients with aortic stenosis, small valve area, and low-flow, low-gradient despite preserved left ventricular ejection fraction, *Journal of the American College of Cardiology* 60 (14) (2012) 1259–1267.
- [13] E.G. Butchart, Gohlke-Bärwolf Ch, M.J. Antunes, et al., Recommendations for the management of patients after heart valve surgery, *European Heart Journal* 26 (2005) 2463–2471.